THE MOTOR AGE

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CROWDUS ELECTRIC VEHICLE

DESCRIPTION OF THE INGENIOUS RUNNING GEAR OF THIS CHICAGO VEHICLE—PROVISION FOR TAKING UP INEQUALITIES IN THE ROAD AND OF WITHSTANDING SHOCKS

The Crowdus Company whose electric vehicle is illustrated herewith is one of the progressive Chicago concerns about which little is heard, but which has embodied a number of entirely original points in the construction of its vehicle. Not only is the carriage a success as a practical vehicle, but it is one of the handsomest pieces of work yet seen in Chicago.

An Experienced Electrician

Mr. Crowdus who has for many years been an electrician and chemist has devoted his time since the automobile first came under his notice to perfecting a motor, drive, battery and frame to give the highest efficiency under the most adverse circumstances. He first figured out his battery and motor, the former proving so successful that he negotiated the sale of his foreign patents some time ago to an English syndicate.

Construction of Framework

The framework of the vehicle is provided with a novel and ingenious provision for permitting it to adapt itself to the inequalities of the road without racking the running gear or necessitating the use of heavy structural methods to sustain excessive shocks.

The main part of the frame resembles, in shape, the letter X, the upper part of the X corresponding to the front of the frame and the lower part to the rear.

The forward arms are rigidly attached to the front axle and the rear arms to the rear axle, the power being applied to internally toothed flanges on the rear traction wheels. The X framework is in two pieces, each forming, with the axle to which it is attached a rigid triangle. These two triangles are jointed at the center of the X in such a manner as to allow either one of the front wheels to be raised or lowered from the place of the two rear wheels any distance.

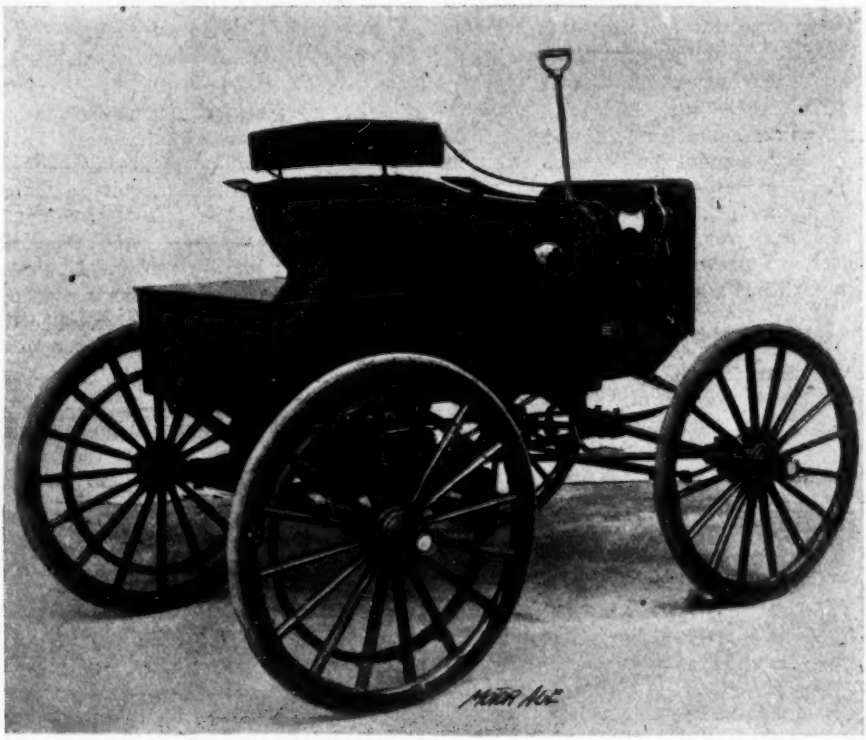
Frame Construction

To the rear triangle are rigidly fixed braces to carry the motor. To reinforce the framework a steel tube is rigidly attached to the rigid supports of the motor, which, it must be remembered, is integral with the rear triangle of the framework, corresponding to the lower part of the X. This steel tube is, again, rigidly attached to the rear part of the joint of the two triangles, making it actually a part of the rear triangle. The steel tube runs forward to the center of the front axle where it is attached by what is, in effect, a ball and socket joint.

Permits of Any Angle

By this arrangement the two axles are allowed to assume almost any angle to their normal, common plane without producing any strain. Stresses produced by the striking of obstacles in the road will pass along the arms of the X in the same manner as if it were rigid throughout. On the rear axle is a double-half-elliptical spring and on the front axle the usual elliptical spring. These springs, instead of being hung on links that extend at an angle towards the center of the springs, in the usual manner, are set at the opposite angle, allowing of greater freedom of movement of the body of the vehicle and the use of stronger springs, which, with the 400-pound weight of the storage

CROWDUS ELECTRIC—FRONT VIEW.



CROWDUS ELECTRIC—REAR VIEW.

battery, Mr. Crowdus considers an advantage.

The steering wheels are hung in the swiveled ends of the axle which are set five degrees off perpendicular so that when the vehicle is turned, the wheels cant in the same direction, the same as a bicycle is inclined in turning corners—not a new idea but an excellent one.

A Lever of Many Functions

The steering and speed changes are all accomplished by means of one lever which is provided with a hinge which allows it to be raised and lowered to facilitate entering and leaving the vehicle. The end of the lever is provided with a spade grip. By moving the lever to the right or left the direction of the vehicle is changed. The spade grip is provided, at one side, with a small lever which is operated by the thumb. By raising this thumb lever, the handle may be revolved on the large steering lever, being held in any desired position by a dog working in notches, as soon as the thumb-lever is released. There are four forward speeds and these may be converted into a similar number of backward speeds by operating a switch which is in convenient reach of the foot. The highest speed is fifteen miles an hour.

A foot brake is also fitted, acting by means of shoes, upon the outer peripheries of the internal spur gears by means of which the rear wheels are driven.

Minor Valuable Features

The body is prepared for the easy handling of the battery by having a number of soft rubber rollers mounted in the floor. As the battery is secured in place it automatically makes its connections with the operating mechanism and signal bell device, relieving the driver of this detail.

Another feature of the carriage which will be highly appreciated is the fact that the battery can be connected with the charging wire and left alone until it is fully charged, at which time an auto-

matic arrangement under the seat cuts off the connection and stops the current.

Indicators are fixed in different positions in the forward part of the vehicle so that the operator can tell just how much power he has remaining in his battery, what current he is using and in what time he has used it—for a small clock is carried also. By the removal of a small wire key, the vehicle is rendered useless, to prevent people from interfering with it when left alone.

Provision for Lighting

Projecting from the sides of the body just below the seat arms, are two nickeled globes, each containing an electric lamp. The glass in front of each is white, rear red and side green. Another novel feature is the form of the dash and the construction below, a feature, unfortunately, not shown on the photographs reproduced. The dash is of patent leather over an iron frame as usual, but is continued below the line of the foot board, ending in a point in the center somewhat like a shallow V. In the center of this point is a lamp, the lens of which is of heavy glass, the front surface being even with the surface of the dash. The lamp is powerful and has a reflector about five inches in diameter. The dash being curved slightly back below the foot-board, throws the light produced by the lamp on to the roadway immediately in front of the vehicle. The lamp is of sufficient size to illuminate the roadway brilliantly for a considerable distance.

THE EQUIVALENT OF A HORSE POWER

A useful table is published in the London Engineer, which gives the equivalents in different units of the horse-power. As understood by engineers, the horse-power is not a definite quantity. It is usual to hear the term used as if it were. The horse-power is a rate of doing work, and was fixed by Watt as that rate of doing work which would raise 33,000 pounds one foot in one minute. For human purposes the horse-power is a fixed rate. Actually, as the year is varying slowly in length, the horse-power of a million years hence will be a trifle different.

It is said that Watt fixed on this curious number 33,000 as being simply about fifty per cent. above the average work of London dray horses, whereby his customers could not complain at any shortcomings of his engines. As steam pressure advanced it became recognized that a nominal sixty-horse engine could be called upon to indicate 300 horse-power and the term has been much misused. As a matter of fact, however, there can be only one really recognized horse-power. Thus, a steam engine will indicate 100 horse-power, but its brake horse-power is, say, ninety only. The ten horse-power has simply been absorbed by internal friction, and to some extent, so far as piston and valve friction is concerned, has been exerted upon the steam and has helped to dry it. An engine uses less steam, in fact, than it would do if it indicated 100 horse-power and had frictionless pistons.

In all problems of mechanical engineering it is often necessary to correlate our units. The table given by The Engineer does this at three different values, the horse-power minute, the horse-power second, and the horse-power hour. Steam engineers mix up their units somewhat, and are apt to confuse the lay mind. Thus they speak of the horse-power in a general sense on its minute basis, but they say an engine requires twenty pounds of water per hour. They mean by this that for each horse-power-minute, or 33,000 foot-pounds per minute which it exerts, it will consume twenty pounds of steam if allowed to continue that rate of work for sixty minutes.

Similarly, engineers refer to coal consumption at an early rate per square foot of grate surface. But a horse-power must

not be taken as 33,000 foot-pounds per hour. It is 33,000 foot-pounds per minute performed sixty times in succession.

It is a little unfortunate that electrical engineers should have introduced new units. The product of the volt and ampere they call a watt, which is only a very small fraction of the steam engineer's idea of what might be termed a watt. Then the electrical engineer's kilowatt is more than a horse-power, about 1¼.

To prevent error, it should be stated that the value of the kilogramme meter is given in terms of the continental horse-power, which is 1⅜ per cent. less than the English horse-power, being only 32,550 foot-pounds per minute.

The very common method of reducing all expressions of energy to foot-pounds in order to find their relative values may be avoided by this table, which gives the necessary factor for direct conversion. For approximate work graphic tables of "curves" are convenient for use in these matters, and engineers who have much of this kind of work to do should construct their own diagrams on squared paper.

In terms of	Per hour.	Per minute.	Per second.
Mile-tons	0·1674 = $\frac{1}{6}$	0·00279	46·5 ÷ 10^6
Mile-lbs.	375 = $\frac{3}{8}$ × 10^3	6·25 = $\frac{100}{16}$	0·104 = $\frac{1}{10}$
Foot tons	884	14·73	0·2455 = $\frac{1}{4}$
Foot-lbs.	1·98 × 10^6	33 × 10^3	550
Inch-tons	10·61 × 10^3	176·8	2·946
Inch-lbs.	23·76 × 10^6	0·396 × 10^6	0·0066 × 10^6
Kilogramme-meters	270 × 10^3	4,500	75
Cubic feet water × feet of fall	31,731	528·88	8·813
Gallons × lb. pressure per square inch	85,800	1,430	23·83
Cubic feet flow × lb. pressure per square inch	13,750	229$\frac{1}{6}$	3·82
Cubic feet flow × inches of water gauge	0·38 × 10^6	6·346 × 10^3	105$\frac{3}{4}$
Lbs. F. degree heat units	2,545	42·42	0·707
Kilogramme C. degree heat units	632·55	10·54	0·1757
Lbs. steam from and at 212° F.	2·63	0·0438	0·73 ÷ 10^3
Fuel burnt in lbs. at 14,000 heat units per lb.	0·1818	3·03 ÷ 10^3	50·5 ÷ 10^6
Fuel burnt in lbs. at 12,725 heat units per lb.	0·20	3·3 ÷ 10^3	5·5 ÷ 10^6
Gas burned, cubic feet at 636 units per cube foot	4	$\frac{1}{15}$	$\frac{1}{900}$
Producer gas, cubic feet at 127 units per cube foot	20	$\frac{1}{3}$	$\frac{1}{1800}$
Joules = watt-secs. = 10 ^{7} ergs	2·68 × 10^6	44·760 × 10^3	746 = $\frac{3}{4}$ kw.-sec.

VIEWED BY ENGLISH EYES

An English engineer writing of a recent visit of his to Paris, after describing a number of engineering feats, the results of which attracted his attention, tells the readers of the American Machinist what he sees and thinks of the auto problem in the following words:

"I saw no electrical tramway equipment in Paris of the overhead type, though there is a line at Versailles. In Paris, however, I saw considerable numbers of very large tramcars electrically operated by means of accumulators which were contained in a flat rectangular box suspended beneath the car and between the two trucks. Running on the same lines, and of very much the same size and general appearance, are numbers of steam cars on the Serpollet system.

"These cars are quiet and clean, and contrast very favorably with the steam motor as I have seen it everywhere else.

In this Serpollet motor the French have solved the problem of steam traction in a way that can only be called perfect, so far as regards the appearance presented in the street and the general cleanliness. Our English steam cars have ever been a nuisance, dirty and evil smelling. The Serpollet car has a nearly inaudible puff for its exhaust, and the machinery and boiler make a very small external show indeed. The Serpollet system of steam generation is a revival of an old idea which aimed at injecting a small quantity of water into highly heated metal, sufficient every stroke of the engine to supply the steam for one stroke. Water is injected into tubes of U shape, very thick and strong, and with only small passages through them. It is said these tubes do not quickly choke, and that if they do ever become furred up they can be cleaned by careful application of hydrochloric acid, all of which I do not doubt the French engineers with their careful methods will carry out. Trains of as many as five tramcars are run through the streets. I traveled by one as far as Versailles, past the new exhibition buildings, which are in a state of considerable forwardness.

"It is not possible to avoid the conviction that automobiles are making much progress. The ordinary Parisian cabby gets a medal or a decoration if he runs over a foot passenger, and I am told the foot passenger who is run over is fined. I can believe it, for the French cabby is a blackguard and will not make an effort of any kind to avoid running over a child. Added to this terror is the modern automobile. The automobile man is evidently fined unless he keeps going at twenty miles an hour. One that I saw in the Bois de Boulogne must have been doing quite thirty miles on a tricycle. A very considerable number of various kinds of vehicles are to be seen, some of which are of neat design. In fact, there is beginning to be the appearance about an automobile which differs from the once common appearance of the horseless vehicle. The early automobiles so evidently were vehicles minus a horse that it was clear that designers had not been able to forget the horse, just as the early railroad cars resembled the stage coach for some time, before the influence of the curved body wore off the minds of their designers.

"Altogether, I saw in a short visit a good deal of French mechanical engineering which pointed to a certain ability to achieve results in some directions that other peoples have failed to secure. And I heard not a word of the very recent 'affaire.' It all seemed to have evaporated like petrol, which it also resembled in having been very explosive during evaporation.

PARIS EXPOSITION TRIALS

Those American makers who anticipate having exhibits at the Paris Exposition next year will no doubt be interested in the program arranged for their benefit by M. Charles Jeantaud on behalf of the committee of the automobile section of the exposition, which program is to be carried out under the auspices of the Automobile Club of France.

In his preliminary report, M. Jeantaud asked for a grant of $25,000 to allow of the following trials being organized: In May a trial of vehicles suitable for touring purposes, these being divided into four classes, namely: those for two, four, six, and the last for all over six passengers. These vehicles will have to cover a course of approximately ninety-three miles each day of the week from Monday to Saturday, with the exception of Thursday, the courses being so arranged as to include a run of thirty-one miles in the morning and sixty-two miles in the afternoon, the start and finish taking place at Vincennes.

Fuel consumption, ease of steering, working of the motor and arrangements for comfort are the points from which the vehicles are to be judged. Speed will be restricted to the limits allowed by law

which is twelve and one-half miles an hour in thickly populated districts and eighteen miles in the country.

Cabs and delivery vans with load capacities up to 1,200 kilogs. (2,640 pounds), will be given trials in June. Each vehicle will have an eighteen and three-quarters mile course to cover in the morning and afternoon of each day of the week except Thursday and Sunday.

Races for all classes of vehicles will be given in July. The courses to be covered will be five in number, ranging between 187½ and 250 miles in length, the start and finish being at Joinville Bridge. Signals will be arranged at Vincennes track, by means of which each vehicle's arrival at Joinville will be noted.

The trials of voiturettes weighing 400 kilograms (880 pounds) and under will be held in August under the same conditions as the touring vehicle. Those for light delivery wagons carrying 100 kilograms (220 pounds) and less will take place in September and will be the same in all respects as the cab trials.

The heavy vehicle trials will be held in October, which trials will close the series. Vehicles included in this class will be those for passenger service and those for carrying goods of more than one ton in weight, as well as all vehicles carrying a minimum of one and one-fourth tons. The distance to be traveled will be thirty-one and one-fourth miles each day in the week, Thursday excepted, and the route will be so arranged that the vehicles will have returned to Vincennes after covering half the distance, the remaining half being finished in the afternoon.

Besides the above trials, it is intended to arrange a series of fetes, one to take place each Thursday on the track to be constructed around Daumesnil Lake in the Bois de Vincennes. During the fetes the owners of automobiles will have an opportunity of showing their skill in the manipulation of their vehicles; speed trials will also be held for voiturettes and motor cycles. Prizes will also be awarded for the most handsomely decorated carriages. This competition is to take place in June, July, August and September.

An interesting part of the program to be carried out the latter part of October calls for a run from Vincennes to the Ville of the Automobile Club in the Bois de Boulogne, in which all the contestants participating in the trials and fetes will be asked to join, the return to the exposition being made in the afternoon of the same day.

When trials or competitions are not in progress, the Vincennes track will be open to owners of automobiles, motorcycles and cycles for training or testing purposes. A separate track will be laid for the use of carriages not having rubber tires, the speed of such vehicles to be limited to eleven and one-fourth miles an hour. Automobile owners, under certain conditions (not stated in the report) will be allowed to carry passengers on the track or exposition grounds and charge a fee therefore.

The estimated cost of carrying out the program as outlined above will be in the neighborhood of $40,000, this to include $9,400 for the five days' race in July, when the winner in the first class will receive $1,600. It is estimated that the receipts will amount to something like $14,400 without the income from concessions granted to caterers, etc. So that with the grant to be made by the automobile committee of the exposition as asked by M. Jeantaud the finances of the club should prove of a highly satisfactory nature.

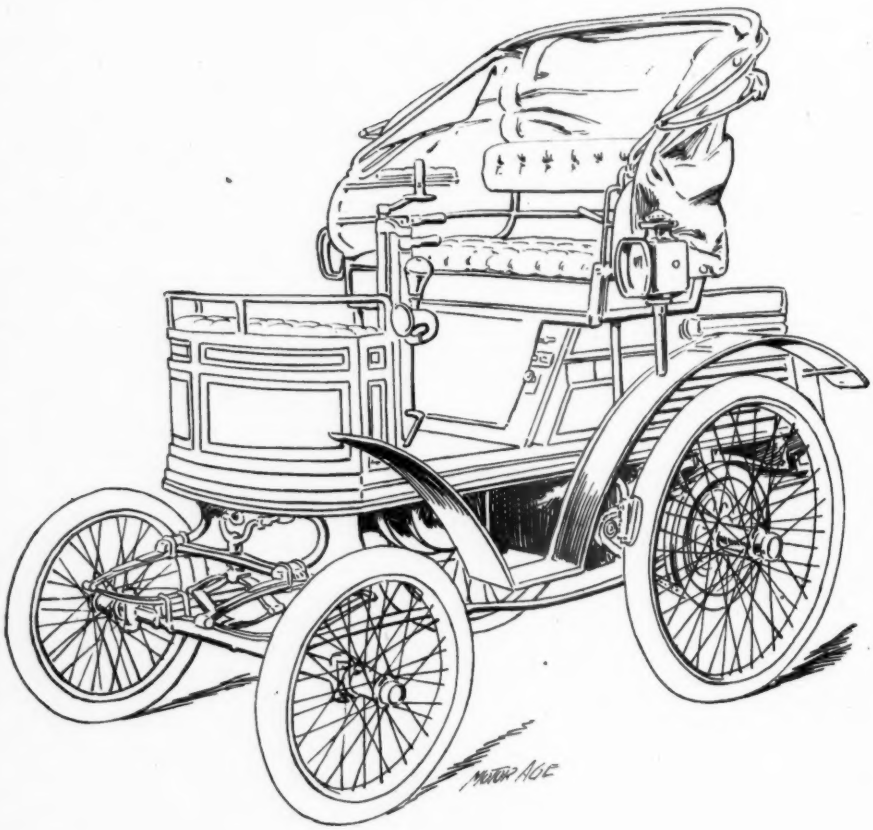
For the benefit of those makers who will be unable to secure space, a special building will be provided by the club capable of housing 300 vehicles. It will be provided with a generating plant for the recharging of electric carriages, also to supply current to an overhead trolley around the Daumesnil track. Stands, storage places, repair shops and other conveniences will be provided for the owners and users of all kinds of self-driven vehicles, a feature which will not fail to be fully appreciated.

American manufacturers who intend visiting the exposition next year may find among the above list of events something that may interest them and at the same time, prove profitable. The eyes of the world will be upon what is exhibited at Paris in 1900 and the movements of all makes of vehicles and methods used will be watched with greatest care and scrutiny. This will be particularly true

of American makes, for news of their accomplishments has spread quickly through the old world and our products are awaited with interest. The Stanley, Sperry and Crowdus carriages have attracted no little favorable attention abroad, the first two in France more especially, and the last in England. What has already been seen has only whetted their appetites the more for what is to come.

No doubt our makers will be on hand to show American products on steam gasoline and electrically driven vehicles and no fear exists as to what the verdict will be when compared with the products of our foreign cousins.

MARSHALL MOTOR-CAR



The accompanying illustration shows the Marshall Motor-Car which is designed particularly for use by physicians, being adapted to use on all sorts of roads to be found in England. It is fitted with a five-horse-power motor. A hood and glass front for use in bad weather are furnished.

MOTOR INDUSTRY ABROAD

THE FRENCH RAPIDLY LOSING PRESTIGE AT HOME AND ABROAD—CAUSES OF THE FRENCH DECLINE—THE FASHIONABLE SET IN VIENNA HAVE POPULARIZED THE MOTOR-CARRIAGE IN AUSTRIA—MOTOR BUSINESS SUPPLANTS THE BICYCLE INDUSTRY IN BOHEMIA

SITUATION IN FRANCE

Paris, Dec. 6.—Like everything French, the motor-car industry shows, in the country of its adoption, the predisposition of the people to take the gilt off their ginger bread. Other countries that have taken up the business on purely commercial lines and are offering a thoroughly rational product, will soon have ousted the French makers all along the line, so far as motor production on a large scale is concerned. Paris is the town of fashion and gayety and will, for a long while, hold place among the cities where large numbers of the vehicles are used, but it will be no exception to the general rule, in this respect, in a very few years.

Parts Are Imported

It is a noteworthy fact to-day that by far the greatest proportion of the parts from which vehicles built in French factories and under French names are constructed, is of foreign make, coming from many quarters of the world, some of them from across the sea, even. The writer questioned a Parisian engineer who has recently constructed a large number of vehicles, on this point. The engineer, while he would not give information as to the exact points from which his various parts were obtained, confessed that at least eighty per cent of them came from foreign countries.

Already Feels Stagnation

A certain stagnation has already set in in France, owing to the competition offered by other countries better equipped in a business way. As long as the prices of motor-cycles and motor-cars were high, France kept to the front and sold motors everywhere, but America and ermany are already spoiling the fun of the French makers as they did in the bicycle business not so very long ago.

Lack of Commercial Principles

France seems incapable of understanding the commercial order that rules the business world to-day, the fact that large production brings economy and cheap prices and that volume of sales compensates for curtailment of percentage in profits. She does not seem to realize that the inevitable reduction in price is the only thing that will popularize motor-vehicles among a large class of people—make them, in fact, necessities. For the Frenchman, business partakes of the nature of a pastime, while his German and American competitors look upon it as a sober problem, requiring their entire energies and greatest resources.

England a Good Customer

Up to the present time England remains a good customer of the French motor-car maker, owing to what appears, from this point, lack of enterprise among the English makers, but there are already signs that the Americans are beginning to influence that market, and that the French with their high-priced and not always practical vehicles will have to retire. The agents of the French firms in London are already complaining of this competition and own that they are not in a position to cope with it on even terms.

Styles That Are Lacking

American manufacturers intending to compete for business in France, should take note of the fact, that in hydrocarbon motors, the French producers are well advanced as far as the application of these motors to cycles and light vehicles is concerned, but that in steam and electrical vehicles, and most particularly in heavy cars for the transportation of merchandise and passengers, France already lags behind and will never get nearer the fore, as her commercial conditions are such as to preclude her from ever being an active competitor in any branch of business where she has not achieved pre-eminence before the countries who rule the manufacturing destinies of the world become factors.

Enjoy Small Triumphs

The French motor-car manufacturers have a fixed idea that their names can

be handed down to posterity only by means of having their vehicles come in first in this or that much heralded speed competition, or by having them used by great personages on the Bois de Boulogne and boulevards. They do not seem to realize that such triumphs, pleasing as they may be, cost money without bringing any adequate reward; that it is only rational production along the lines that take into consideration the wants of the greatest number of possible purchasers that can prosper; and that those who are in the business for profit must look to the future for their honors, not content to rest on temporary triumphs while the goal is still far away and eager competitors are working to undo those triumphs by accomplishing greater ones.

Need Stimulus of Fashion

No French industry which does not undergo the constant changes of variable fashion, wherein the Frenchmen show, to the best advantage, their unique and bizarre ideas, has ever prospered permanently, and the motor industry will but add another to the long list of industries in which the French have led, so long as the article served but to satisfy the caprices of fashion, and then lagged and finally abandoned the field to other nations possessing a greater adaptability for investigating the commercial possibilities and for producing rational qualities in economically large quantities.

PATRONAGE OF AUSTRIAN ELITE

Vienna, Dec. 4.—It was for the purpose of popularizing the horseless vehicle among the aristocracy of Austria that the Austrian Motor Club was organized. In pursuance of the object of its formation, it schedules frequent runs, or "parades," as they are termed, on some one of the splendid roads for which the capital on the Danube is famous. The owners of automobiles attend in full force in vehicles filled with their families and friends. These parades are always excellently managed and always prove enjoyable functions.

As those who reign in the social sphere of Vienna have declared for the automobile, the parades are mirrors of fashion and include almost all the social notables, which fact converts them into popular spectacles, attended by immense throngs of sightseers. Motor driving would never have become so popular as it has here in so short a time if its devotees had not included the cream of the fashionable feminine world, who show the same avidity for motor driving that it did for cycling a few short years ago, and which resulted in such immense sales of cycles in this city, and, in fact, all over Austria.

Valuable Advertising

The use of the automobile by this class and in this manner has had the effect of rapidly introducing and popularizing high class motor-vehicles of all descriptions and has done more in this direction than any possible amount of advertising would have done. The general populace is of such a nature that once they have a clear demonstration of any device that is both practical and economical, they will not be long in adopting it. Therefore the future of the automobile is assured.

One of the recent parades was held on the maneuvering plain near the Franz-Josef barracks, where Count Potting, the well known sportsman, received all the motorists of Vienna in the name of the Austrian Motor Club. Among those present were members of the nobility, political dignitaries, military officers and foreign ambassadors. During the parade military bands were stationed at different parts of the road and helped swell the crowds who came to see the spectacle.

Opportunity for Export

Motoring is rapidly growing in popularity not only in Vienna but all over Austria and enterprising salesmen will find plenty of customers for light, stylish vehicles. As all the home makers have orders that will keep them busy for the next two years, at the present rate of production, there is a great chance for the firms that can offer goods for early delivery. This offers a field not only for selling in the near future, but for permanently popularizing American motor-cars and motor-cycles, which should not be lost sight of.

INDUSTRY IN BOHEMIA

Gratz, Austria, Dec. 2.—The old Bohemian capital in Austria has long been

known for its bicycling industry, some of the makers achieving world-wide reputations. But Gratz, in common with other centers of the bicycle industry, felt the decline in business caused by overproduction and the manufacturers were quick to realize that it would not be until the industry had settled down to a point where the demand could be predicted with some fair degree of accuracy, that there would be any profit in it. With equal promptitude they realized—about two years ago—that their plants and workmen could be profitably utilized in the manufacture of the new novelty, the motocycle and the motor-carriage. They at once adopted the auto for their own purposes and have now developed, in addition to their bicycle business, an industry that has no equal in the Austrian empire. A short description of the leading factories will not, therefore, be out of place in the Motor Age.

Description of Factories

The Styria Cycle Works have built a motor which is quite unique in its design and construction, although they have not yet gotten it to the point where they are prepared to put it on the market, being engaged, however, in daily tests which are progressing so satisfactorily that the firm expects to begin very soon manufacturing in quantities.

The founder of the bicycle industry in Gratz, John Puch, has recently transferred his concern to a limited company, in order to get the necessary capital to take care of his largely increasing business in motor-carriages and motocycles, the production of which he began in 1898 and has carried on with the greatest success.

The Motor Cycle Works entered into an agreement with one of the German manufacturers for the control of its patents for the Austrian empire. The firm has already constructed many vehicles and is now busy day and night attempting to keep up with orders, and still customers are obliged to undergo long waits.

Foremost Makers

The foremost among the makers is the Graziosa Cycle Works, known for their chainless cycles, which were their sole product previous to their embarking in the motor industry. Their first batch of motors was delivered late last summer. The progressiveness of this firm has insured it a permanent place in the motor business. The factory, which was recently enlarged to a point where it was thought it would meet all possible needs, is already too small for the growing industry. The demand for vehicles has surpassed the fondest dreams of the firm and now another addition is being constructed to the immense factory. The orders with which the firm is now overwhelmed increase in number in direct proportion to the publicity gained by the vehicles which they already have out.

Cause of Success

This is largely due to the fact that they captured, for their technical staff, already large, one of the best known French engineers who had several years' experience in French factories. He brought with him several departmental superintendents who now have entire charge of the motor manufacturing. A new motor has been patented and construction will be begun on a large scale as soon as the parts can be obtained.

The firm follows the practice of selling motors separate from the vehicles for those who desire to build their own cars or cycles, in addition to complete vehicles. Their cars and cycles are all in the latest French style. The regular styles are seven in number and vary from a convertible tricycle to a twelve-horsepower omnibus and trucks designed to carry two or three tons.

The only obstacle in the path of the industry in Gratz is the difficulty in obtaining parts which can not be made in the city.

STUDY OF BRAKE PROBLEM

THE NECESSITY OF BRAKES THAT WILL NOT ENDANGER THE SAFETY OF INCAUTIOUS AND INEXPERIENCED DRIVERS—DANGERS OF SUDDEN APPLICATION OF POWERFUL BRAKES POINTED OUT

In automobile construction, the problem of providing brakes seems to be one that has not been investigated with the care it deserves. All constructors realize the necessity of having powerful brakes and some of them have gone so far as to provide three distinct methods of bringing their vehicles to a stop.

So much attention has been paid to providing brakes that are sufficiently powerful, without permitting them to work injury to the tires or other mechanism of the vehicle, that one point seems to have been entirely overlooked, that of providing brakes that, while acting quickly, will not show their greatest efficiency (for stopping the vehicle) too suddenly, when the vehicle is going at a dangerously high rate of speed.

Possibilities of Upsetting

Let us suppose, for example, that a vehicle is capable of being driven at the rate of twenty miles an hour. It will be readily understood that it is impossible to bring it to a stop, when traveling at this speed, in any very short space. The distance in which it may safely be brought to a standstill is governed by the height of the vehicle from the ground, its weight, the distribution of that weight, vertically and longitudinally, as well as the size of the tires, the material of which they are made, and the condition of the road surface, not to mention the point at which the brakes are applied.

Dangerous Constructions

If the vehicle set high off the ground, if its center of gravity be well up and well forward, and if the power of the brakes be applied suddenly to the front wheels, it will readily be seen that a summersault is inevitable. The result would certainly be as disastrous as a collision, particularly if the vehicle be a heavy one. If it be going down hill, its overthrow is only the more certain. It is not necessary that the extreme of these conditions prevail in order that the vehicle, with the aid of an unskilled driver, shall be able to compass its own downfall, particularly on grades where brakes are most needed. Of this danger there has been little heard in this country, for the reason that almost all users of automobiles have been cautious owing to the fact that the properties of all horseless vehicles are an unknown quantity, but, as soon as they become common sights and novices arrive at the point where they think that all that is necessary to successfully pilot one, is to operate a simple system of wheels and levers, then the trouble will become apparent. It has been experienced in France very largely.

Confidence Causes Trouble

Now, at the lower speeds, the most powerful brakes may be applied without danger of upsetting the vehicle, but when going at the higher speeds the danger that is incurred in a sudden application of very powerful brakes is apt to lead to greater danger than would the entire absence of brakes. At the first sign of danger, the inexperienced rider is apt to jam on the brakes regardless of results, taking time to think only after he has been rescued from a ditch or dragged from under the overturned vehicle. To make the auto as nearly "fool-proof" as possible should be the aim of every builder. To this end he should endeavor to provide some braking device that will make it impossible for the novice to apply the full power of the brakes when the vehicle is going at dangerous speeds. No such device has been shown, so far, but to devise such a one should not be at all an impossible task.

Need of Precautions

Given the speed, which, in any particular style of vehicle, represented the limit at which the full braking power could be safely applied, a governor operated by the driving axle could be arranged so as to decrease the braking

power in proportion to the increased speed of the vehicle.

A Not Impossible Task

Under some conditions it would be well to apply the brakes to work directly or indirectly on both front and rear wheels. To do this, however, going at a high rate of speed down hill would be suicidal. A not too complicated brake could be constructed that would allow the power to be applied in full force simultaneously in front and in the rear for moderate speeds; in full force, only, at the rear, for somewhat higher speeds; and with less force on the rear, only, at still greater velocities.

Of course such a brake would not meet all the requirements of "greasy" city pavements, but could be supplemented by brakes acting directly on the tires where such conditions prevailed, the slippery mud regulating the action of the direct brakes.

A Frenchman's Warning

A writer in a French paper some little time ago preached a long sermon on the dangers of a too sudden application of the brakes at high speeds and tried to impress on his readers the necessity of using caution. In the course of his article he says:

"But I have my brakes," says the novice. That is a stock expression. People depend on their brakes. They depend on their brakes too much, very much too much. In the first place people always exaggerate their coolness; secondly, it is necessary to exaggerate their coolness, otherwise they must exaggerate the efficiency of their brakes. I would not care whatever might be the power of a vehicle's brakes, so long as they lowered the speed and so long as they restored equilibrium to the vehicle when it vacillates. Far from this being the case, however, whenever a vehicle begins to lose its equilibrium, the sudden and firm application of the brakes brings about a summersault; and the greater the power of the brakes and the more you depend on them, the more they will overcome you.

The idea did not seem to occur to the writer to provide brakes that would prevent the overturning of the vehicle by the inexperienced driver. The maker who has his business reputation to guard is far more amenable to reason than the foolhardy driver who has only his neck to care for. Therefore the Motor Age addresses the maker.

HARRIS' MARVELOUS AUTO

As a rule, people interested in anything new in the motor vehicle industry are altogether too secretive for their own good. This is not the case with S. V. Harris, of St. Paul, however. He is interested in an auto concerning which the newspapers have received some hints, and now, before he is prepared for publicity, he is being overwhelmed with correspondence. While the Motor Age has no disposition to damage the business prospects of any worthy automobile enthusiast, still it feels at liberty to give particulars about the Harris vehicle.

The manner in which Mr. Harris became interested in the motor-vehicle problem is interesting. A few months ago he was a visitor to Chicago. His particular friend, F. W. Buskirk, assistant general passenger agent of the Erie lines, took him out for a ride over the Chicago boulevards on a bicycle. Later, when Mr. Buskirk visited St. Paul, Mr. Harris decided to give his friend a return ride in an auto, and, accordingly, chartered an electric cab. The two had not gone more than half a block, however, before the cab came to a standstill and refused to budge. After trying all the known methods of inducing the obdurate vehicle to move on, including moral suasion, the pair gave up the effort and were obliged to resort to the old fashioned horse drawn cab.

This set Mr. Harris to thinking. He saw no reason why an auto could not be built that could be depended upon. The fact that Mr. Buskirk had exhibited great disappointment at the failure of the auto, showed him that there was a

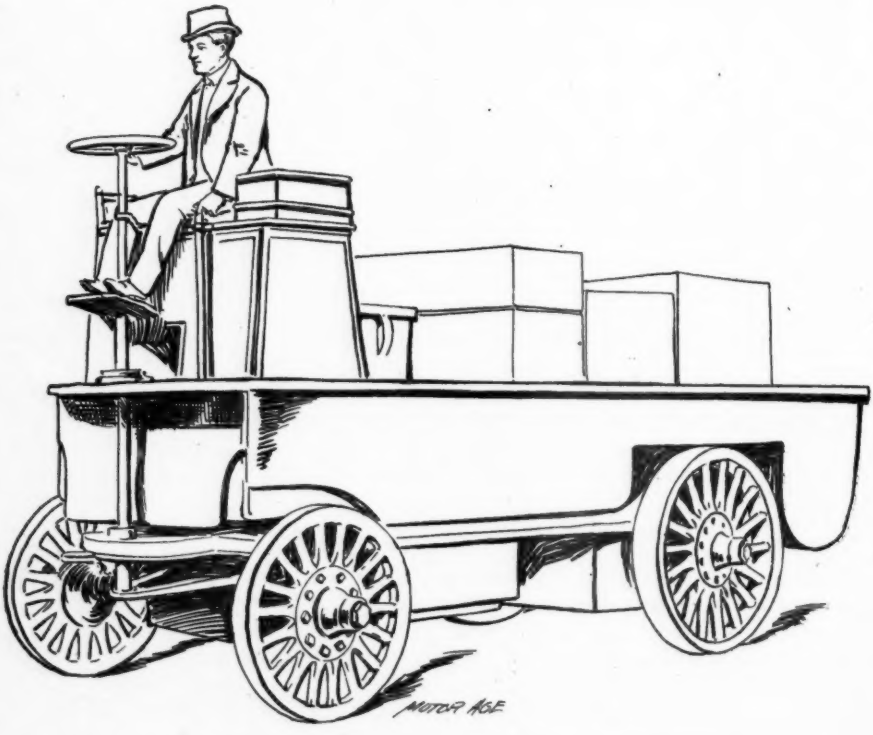
great financial future before the man who could furnish an automobile that could be absolutely depended upon. He set to thinking and investigating.

After a while Mr. Buskirk received a letter from his friend saying that the latter had, at last, succeeded in producing a motor-vehicle that could be depended upon to work at all times and under all conditions in which an auto of its type could be expected to be found. He finished by telling his friend that he had sent him a sample of the vehicle. In due course the express company delivered the vehicle to Mr. Buskirk's office address. The recipient of the handsome gift was so much pleased that he could not help telling his friends about it, and, somehow or other, the newspapers got hold of the story and published it.

Immediately Mr. Harris was deluged with mail and his troubles began, while Mr. Buskirk was overrun with visitors who wanted to know all the particulars about the vehicle of which so much complimentary had been said—which possessed a motive power that "is not steam, electricity, naphtha, or gasoline, and which is cheaper than any of them."

Mr. Harris telegraphed Mr. Buskirk for a stenographer to attend to his increased mail and the latter forwarded a description of a suitable one to Mrs. Harris and she promptly vetoed the proposition to import a Chicago damosel.

In the meantime, Mr. Buskirk keeps his new auto in his office. The vehicle is built on the same lines as the generally seen electric cabs and is handsomely painted, but it is hardly large enough to be of any great service before Christmas, being about ten inches in length. Its motor is a good old-fashioned coil spring and its ease of running depends very largely on the frequent and liberal use of a large oil can which accompanies the vehicle.



AUTO-TRUCK RECENTLY TESTED IN NEW YORK CITY.

MOTOR OMNIBUSES FOR BOSTON

FRANCHISES GRANTED FOR SEVERAL LINES IN THE NEW ENGLAND METROPOLIS—NEW CONSTRUCTION BY THE COLONIAL AUTOMOBILE CO.

Boston, Mass., Dec. 17.—Motor omnibuses running through Boston streets will be a common sight within a few months, as the board of aldermen has just granted locations petitioned for by the company behind the measure, known as the Boston Transit Company. The president of the company is Benjamin D. Hyde, a well-known lawyer of this city, and some of the stockholders are Hon. M. M. Cunniff and Col. Albert A. Pope of the Columbia and Electric Vehicle Company.

Under Massachusetts Laws

The company is organized under the strict corporation laws of Massachusetts and is authorized to "act as common carrier of persons, parcels, mails, baggage, merchandise and other property by means of 'buses, cabs, wagons and other vehicles propelled by electricity, compressed air, gasoline or other means of locomotion."

The aldermen have granted the company permission to run over three main routes from the suburbs to the city proper, two of the routes being over streets not supplied with trolley cars, which gives the new company a monopoly of traffic on those routes.

Routes to Be Operated

The first route is from St. Mary's Street in the Back Bay, or residential district of the highest class, over Beacon, Dartmouth, Arlington, Boylston, Tremont and Sudbury Streets to the North union railroad station, and return by the same route. The distance one way is just three miles.

The second route, intended to handle a portion of the tremendous summer traffic to the park system, composed of persons who have been accustomed heretofore to use the street cars, with a better and more pleasing route, is by way of Adams Square, near Faneuil Hall, over Brattle, Tremont and Boylston streets to Park Square; thence over Columbus avenue, Seaver street and Blue Hill avenue to the park station at Franklin Park, the city's largest breathing space. The return trips will be made by way of Blue Hill avenue, Seaver street, Columbus avenue, Park Square, Boylston street, Tremont, Court and Washington streets to Adams Square. This route is five miles long.

Tapping a New District

The third route, two miles, is to accommodate the Back Bay shoppers and theater-goers and runs from the corner of Tremont and Park streets over Park, Beacon and Arlington streets and Commonwealth avenue to the Fenway, thus tapping another park system almost monopolized by the bicyclists. In case of blockades the company is allowed to use such streets as may be necessary to pass around the obstructions.

At the last election, the city voted two to one to keep the surface tracks off Tremont street, although the street railway people made a hard fight to have them replaced, after they had been removed subsequent to the digging of the subway. This fact makes possible the motor 'bus lines, all of which will touch Tremont and Boylston streets, now bare of tracks as far as Park Square, which will thus supply the lacking transit facilities.

Equipped for Heavy Work

The omnibuses, which are now being built, will be planned with especial reference to Boston needs. The city has narrow and crooked streets with heavy grades on the routes named. As to fares nothing is yet available, although the officers of the company promise to make their plans as fully public as good business will permit, at an early day.

Mr. George E. Hatch, of the Hatch Storage Battery Co. of this city, was arrested Saturday night in Quincy on the charge of libel. The company manufactures storage batteries for all purposes, including automobiles. Mr. James P. Clare, of Quincy, connected with the Hatch company, was prosecuted recently on the charge of perjury in connection with a sworn statement concerning the

affairs of the company, but was discharged by the court.

Libel Charge

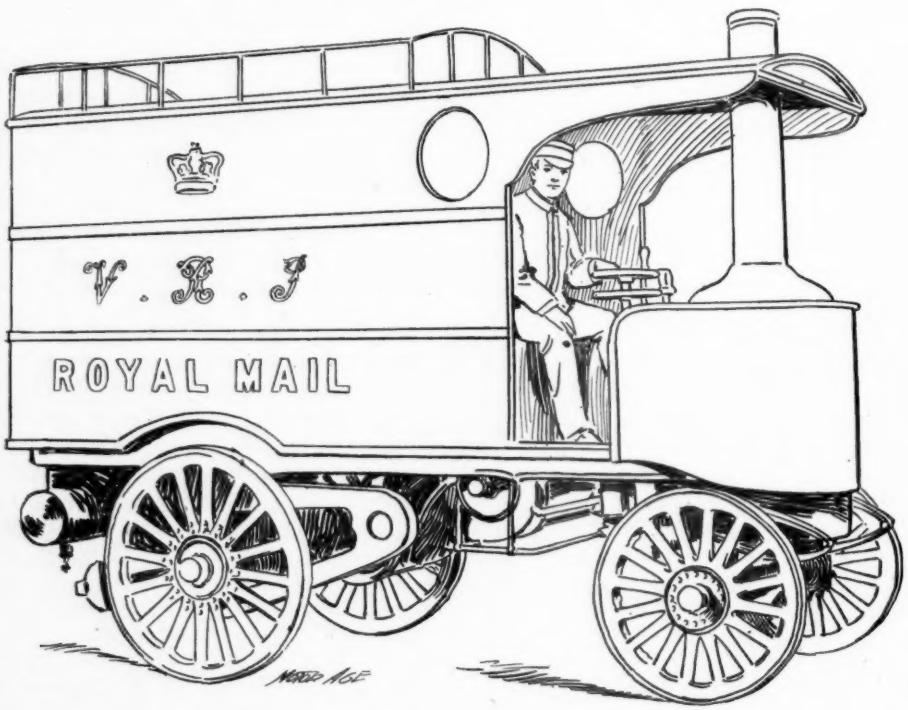
In replying to a letter from Mr. Clare published in a Quincy paper and relating to his arrest, Mr. Hatch accused Mr. Clare of having committed the offense for which he was arrested and later exonerated. Mr. Hatch furnished bail.

Mayor Josiah Quincy, who took the lead in installing automobiles for the use of city employes, will leave office early in January. He has a workshop at 62 Sudbury street where he is investigating automobiles and it is expected that he will form a company for the manufacture of a carriage. Victor Berlanger, widely known as an inventor, is associated with him.

Five Wheel Construction

The Colonial Automobile Co., of Boston, and Newton Lower Falls, will have its first steam wagon from designs of A. W. Kent ready for inspection in a couple of weeks. This carriage has one wheel in front and three behind, the middle one of the three only being used as a drive wheel, the other two acting as supporting wheels by means of strong springs.

LANCASTERSHIRE STEAM VAN



The van shown in the accompany illustration is one built by the Lancastershire Steam Motor Co. of Leyland, England, for use by the British government in the postal service in Ceylon. It is constructed to carry one ton of mail matter and will average ten miles an hour on fair roads. The van was put through a long and severe series of tests by the British postal authorities before it was allowed to be despatched to its destination.

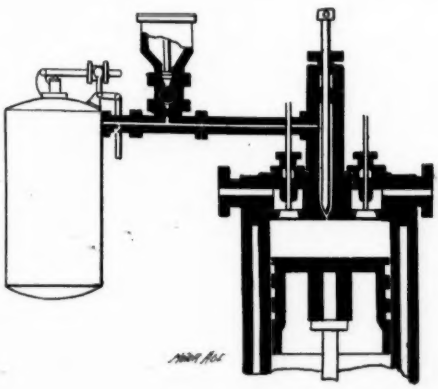
WHERE THEORY OR PROMISE PREVAILS

PROBLEMS WORKED OUT

DIESEL'S GASOLINE ENGINE WHICH CONTAINS A SELF-ACTUATING EXPLODING DEVICE WITHOUT THE USE OF ELECTRICITY OR HOT TUBES—AN ELECTRIC LOCOMOTIVE—AUTOMATIC BELT LIGHTNER—TIRE ATTACHING DEVICE—BALDWIN VEHICLE UNDER TEST

DIESEL MOTOR

Rudolph Diesel of Munich, the inventor of the heat engine bearing his name, has announced the result of extended experiments through which he has invented a means of effecting ignition and combustion in internal-combustion engines, says Modern Machinery. The method consists in compressing the combustible charge to a degree below that at which it attains its ignition temperature, and then forcing into it another combustible having a lower ignition temperature, such that it becomes ignited by the heat of the compressed charge and thereby effects its combustion. Again, by varying the manner of the introduction and the proportion of the charge introduced, the combustion of the working charge can be correspondingly varied.



The first part of this discovery relates to the subject of producing ignition in gas engines. By this invention ignition of the explosive mixture compressed in the cylinder of a gas engine is produced by the injection into it of a liquid gas or mixture spontaneously combustible at the existing temperature and pressure. The spontaneously combustible substance, such for instance as benzine or acetylene is injected into the cylinder in such a manner and quantity as to ignite the explosive mixture locally or throughout its whole bulk, as may be desired. In the accompanying cut the injection valve for the introduction of the spontaneously combustible substance is seen at the top of the cylinder connecting through tubes with the tank containing a supply of this substance.

AN ELECTRIC LOCOMOTIVE

The C. W. Hunt Company, manufacturer of coal handling machinery, whose factory is at West New Brighton, Staten Island, has invented and is manufacturing, and, in fact, has in operation at its own factory a so-called electric locomotive to handle cars on industrial railways in foundries and big machinery plants, where heavy material has to be handled. Hitherto it has been customary to have a narrow gauge track built on which trucks, pushed by hand are run. This meets insurance company objection to a trolley system, as trolley wires are not admissible in shops and factories. The locomotives are carried on two four-wheel trucks and they run around the twelve-foot radius curves of industrial tracks, thus meeting the previous difficulties of short curves. All the wheels are driving wheels in order that the necessarily great weight of the storage battery may be utilized in giving greater adhesion to the driving wheels. The locomotive carries the battery, motors and gearing above the car platform with every part in plain sight for inspection or adjustment and the whole perfectly spring mounted. Though these motor trucks are referred to as "locomotives" they are in no sense locomotives, except in the fact that they are used to draw

trains of cars. It has been deemed undesirable to mount the electric motors on the axles as in street cars because the space between the wheels is very small in narrow gauge cars and all the available room below the platform would be literally filled with motors, gears, cases, and wire cable connections, crowded and covered up, and difficult to protect from dust or mud.

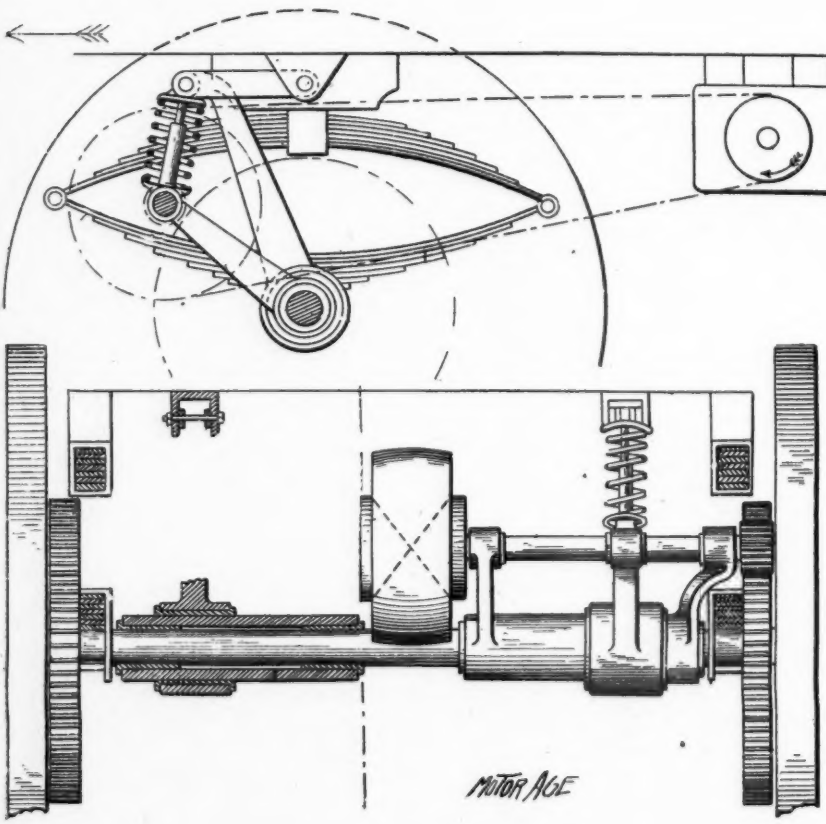
AUTOMATIC BELT TIGHTENER

638,816, to George Erich Seig, Kalk, Germany.—This is a device designed to allow a motor carried in the body of a vehicle to have the driving shaft at a constant distance from the axle of the driving wheels and still allow of the use of springs between the axle and the body. The workings of the device can be easily understood by a casual inspection of the accompanying illustrations. Two claims are allowed, of which the first is as follows:

"In a driving mechanism for autocars and the like, the combination with the motor-axle and driving-wheel shaft, of a shaft movable circumferentially about said driving-wheel shaft and geared thereto, a pulley carried by said movable shaft, a belt connecting said pulley with the motor-axle, and springs acting on said movable shaft and tending to force it away from said motor-axle and thereby maintaining tension on the belt, substantially as described."

TIRE ATTACHING DEVICE

No. 639,165, to Rudolf Freysinger, Riga-Sassenhof, Russia.—This is a device designed to overcome the difficulty of attaching a rubber tire to a wheel without the necessity of having it non-continuous or of placing the rubber under ten-



SEIG'S BELT TIGHTENER.

sile strain. In some respects the provision for overcoming these difficulties is similar to the Munger device, recently described.

The solid rubber tire is moulded over a circular steel band, close to the inner periphery, and is reinforced by canvas extending into the body of the tire. A grooved rim to fit the tire is split transversely at one place and is sufficiently flexible to permit of being reduced in periphery while the tire is being inserted in the groove. After this has been accomplished, the grooved rim is allowed to resume its normal circular shape and the whole is slid over a wheel provided with a rim or ring that exactly fits the rim into which the tire is inserted. The latter is held in place by screws or rivets. One claim is allowed as follows:

"The combination with an elastic tire having a metal ring embedded therein, of a collapsible wheel-rim and a wedging or filling ring provided with spokes, substantially as described."

BALDWIN TEST

The Baldwin automobile, the new horseless carriage manufactured by local parties, was given a very severe test according to the Providence Telegram, when the machine, in charge of Mr. Baldwin, the inventor, mounted College Hill, and disported itself on the steep grade in a manner which showed that it was perfectly at command of the guiding hand. The first attempt made was to run the automobile up the hill backwards and this was accomplished easily.

According to the city engineer, this grade is fourteen percent for a portion of the way and eighteen percent for the balance, making the steepest grade in the city as far as the streets are concerned. From this test it could easily be seen that the Baldwin automobile is as tractable as the gentlest horse.

Tests were also made to show the safety of the machine from the standpoint of brakes. The carriage was run up a part of the hill and the brakes applied and immediately it came to a standstill and remained stationary on the steep grade until the brake was released and the power again applied.

The power used is steam and the patents owned by the company cover a machine which practically condenses all the steam used and sends it back into the boiler to be used anew. In this manner the steam is practically inexhaustible and when the boiler has once been filled the water is sufficient to propel the carriage for 150 miles or more.

The work of the automobile during the entire test was practically noiseless and the ascent of College Hill was accomplished with but 150 pounds of steam, a strange thing being that when the carriage returned again to the foot of the hill there was a pressure of 200 pounds of steam on, showing how little steam was necessary for the ascent.

MINOR NEWS AND COMMENT

CLEVELAND POSTAL TRIAL

Postmaster Dewstoe of Cleveland, not to be outdone by the postmasters of other cities, has applied to the Washington authorities for permission to try the auto for collecting mail in his city. The permission has been accorded and he will experiment with a Winton vehicle.

The Winton Motor-Carriage Co. write particulars of the first test which was made last Thursday, substantially as follows:

The weather conditions were extremely bad. Snow had been falling all the previous night and continued in a blizzardly fashion during the entire test and many snow drifts were encountered. The unpaved streets were, of course, in very bad condition.

Mail was collected in what is known as the Euclid district which contains 101 letter boxes and twenty-five paper boxes. The distance covered was twenty-two miles. This route is covered, on schedule, by horses and wagon in a trifle more than 6 hours. The collection was made

in a light wagon equipped with the same style motor fitted to the Winton phaeton, in 2 hours and 27 minutes, a saving of more than fifty percent in time.

INTERNATIONAL CUP

New York, Dec. 17.—The Automobile Club of America will hold a meeting this week to decide upon the question of representation in the International Cup Race to be held in France next year. Entries must be in the hands of the entry committee in Paris by January 1, and will be accepted from only one club in each country, each club being confined to a representation of these vehicles. Alexander Winton has declared his willingness to enter the contest and to post the necessary $600 forfeit, and, from the present outlook, there will be at least one other maker who will enter.

If one of the Americans should succeed in carrying off the cup, it would be a great thing for the industry in this country. Little attention has been paid to the construction of vehicles for mere speed whereas the French have been building racing machines for the past five years.

The same conditions seem to prevali among the automobile makers in reference to exhibiting at the coming Cycle and Automobile Show at Madison Square Garden, as in their inclination to gain publicity at present through other means of advertising. Those who are turning out wagons are so far behind with orders that they are loath to do anything that will increase the annoyance and size of the flood of inquiries and demands for autos that are pouring in upon them. Besides this the American Bicycle Co. has secured such a large proportion of the floor space most available for automobile exhibition for its cycle exhibit that there is really little space left for the new trade, even should it desire to make a more general exhibit. In the face of the fact that the public, looking upon the bicycle as an established and by no means novel institution, has the most general and eager interest in automobiles, there will be but a few concerns represented, though there will be quite elaborate display by some of them. There was talk at the last meeting of the Automobile Club of an auto show in this city in the spring, promoted by the club on the lines of the outdoor exhibition given by the English organization purely in the interest of sport. There was, no doubt, some idea of holding this in Madison Square Garden. Since then there has been an application for the rental of the Garden in the spring by business men for the promotion of an out and out automobile show for the profit there is in it. With the big demand there is sure to be, when spring opens, for investment in the new style of locomotors and the probabilities that the big factories now in course of construction and already in operation will be able to turn out a sufficient number to spare for an exhibition and perhaps even for sale, there would seem to be a favorable opening for such an enterprise.

One of the most enterprising and progressive of New York business men, already engaged in the carriage trade, as well as vehicle tire manufacture, talked some weeks ago of starting a permanent automobile exhibition and salesroom, where intending customers would have the chance to see the various models, compare them, and negotiate for their purchase. Such permanent exhibitions and marts have been successful in the furniture and other trades, with not half the encouragement to prospective success an automobile exchange would have.

INTERNATIONAL MOTORCAR

The illustration shown on the front cover of this issue of the Motor Age is that of a motor-vehicle manufactured by the International Motor Car Co. of London. It is suitable for use by physicians, one of whom speaks of it in the following flattering terms:

"I have had my car nearly a year now, and have run it about 5,000 miles in all weathers and over all kinds of roads. I have used it daily in my work, and have never had a stop or breakdown but once. I have never had any difficulty in starting it, and it runs as well as ever it did, probably better, owing to my increased experience. I have done as much as ninety miles in a day, and have just returned from a trip of 170 miles to the south coast and back, which we managed with-

out a hitch of any sort. It has answered every expectation, and has done the work of more than two horses, easily and reliably, and, as I have before told you, I am more than satisfied with the car."

THE AUTO IN AFRICA

One of the first projects for the use of the automobile in Africa is that which has been recently taken up by a French company, the Compagnie de Transportation du Soudan Francais, says the Scientific American. A treaty has lately been passed with the government, permitting it to engage in the transportation of merchandise in Soudan, of which the French possessions hold an important place. Between the station of Kayes, the limit of the present railroad, and the Niger, lies a stretch of country of about 300 miles, which at present has but little transportation facilities, and it is this gap which the new company proposes to fill up with the aid of automobiles, which will thus join the railroad to the right bank of the Niger. The vehicles will be of a slow-speed pattern and will follow a kind of wide grass road running through this part of the country; this road, while impracticable in the rainy season, is at other times quite well adapted for the passage of automobiles. About fifty will be needed to supply the demands of traffic. These are now being constructed by one of the large Paris factories. One peculiarity of the service is that Chinese are to be employed as conductors, these having been chosen because they are able to support the climate of the region and are more intelligent and capable than the natives.

DEAL IN MACHINE TOOLS

There is a large deal in machine tools pending, says the Iron Age. The matter is being kept unusually quiet. As the purchases have not all been concluded they are not saying a word which would tend to reveal the identity of persons who are manipulating affairs. It is said that the machinery will be utilized in the equipment of an automobile plant. The report has it that the purchaser is stopping at the Waldorf-Astoria Hotel. One machinery merchant who says that the prime mover in the deal visited him, states that it is the Electric Vehicle Company, whose main office is at 100 Broadway, that are referred to. Mr. Hill, who would probably have charge of such a transaction for this company, could not be seen to-day. It was also intimated that Lieutenant Eames might be in town, but the hotel authorities say that he is not stopping there. The Electric Vehicle Company, it will be recalled, are really an arm of the Columbia & Electric Vehicle Company of Hartford, Conn. They are operating a fair sized plant on Forty-second street, New York, at present, and it has been stated at times that this equipment would be removed to Hartford and supplemented with other machinery for the building of another plant at Hartford.

MOTOCYCLE FIELD

New York, Dec. 17.—The French racing men now in this country for the indoor races marvel at the small number of automobiles seen in the streets as compared with those in Paris and especially the almost entire absence of motor tandems, singles and tricycles, so popular on the other side. American manufacturers seem to be losing a chance to turn out a very popular form of motor cycles, if their popularity in Paris is any sort of indication of the favor they would receive here. To be sure The Waltham Mfg. Co., the E. C. Stearns & Co. and the Columbia Electric Vehicle Co. have been turning out some motor pacing machines, but these have been used hitherto, almost exclusively for exploiting the speed of the Orient, Yellow Fellow and Columbia cycles. The Stearns people have expressed some intention of producing a bicycle, but their main effort in this line has been in the direction of parcel carriers.

By the way, a Stearns automobile is seen on Broadway frequently and its graceful lines and tasteful decorations are much admired as it passes. It is a surrey in style.

EQUIPPING A FACTORY

The Automobile Company of America are purchasing a fair sized equipment for a shop, which they are fitting up at

Marion, N. J. With this company is identified the American Motor Company. The two concerns occupy the same New York offices and will operate the same works. In fact, the motors of one company will be used in the building of the vehicles of the other. The machinery which they are purchasing will be installed in the old "iron and glass" building near the Pennsylvania Railroad station at Marion. This factory was formerly occupied by the Daft Electric Motor Works and other electrical concerns, but has for the last seven years been vacant. The new occupants are now having the place put in shape.

J. W. Chapman, mechanical engineer of the Columbia Electric Vehicle Company of Hartford, Conn., is authority for the statement that orders have been placed for the equipment of the company's new forge shop and power plant. For the latter Beach boilers and Slater engines have been ordered. The forge shop will be equipped with Billings & Spencer drop hammers.

AUTOMOBILE TOUR

A grand tour of 1,100 miles for motors of every description has been organized in London in order to place the automoton and its capabilities before the public in a manner at once interesting and practical. The tour will be from London to Edinburgh and will take place next March. The route will be a zigzag one, in order to attract the general attention of the country. There will be nine one-day exhibitions at the same number of important provincial towns en route, and gold, silver and bronze medals will be awarded as prizes.

PACKARD'S EXPERIMENTS

Two years ago Ward Packard, of Warren, Ohio, purchased a Winton vehicle. After operating it twelve months he commenced work on a vehicle of his own and spent another year in experiment. He is now using his own carriage and is so well satisfied of its merit that work has been commenced on fifteen for the market. Mr. Packard is a believer in plenty of material, evidently, for it appears that his vehicle is heavier and his motor more powerful than most of those so far produced. He claims, as a result, ability to travel at a good speed over any of the roads within 150 miles of Warren and that they are among the poorest, is common knowledge. The framework is made of brazed tubing, manufactured by the Columbia Mfg. Co., of Niles, Ohio. Should it prove satisfactory the company will install machinery for its manufacture in large quantities.

WASHINGTON RESTRICTIONS

Washington, Dec. 16.—In view of the increasing use of automobiles in this city, the District Commissioners have deemed it wise to place them in the same category with bicycles, so far as speed limitations are concerned. An order to this effect has been issued and hereafter the speed of these vehicles will be restricted to twelve miles an hour within the city limits and fifteen miles an hour outside the city limits.

BELGIAN TAX ON AUTOS

Consul Roosevelt writes from Brussels, that the royal decree has approved the resolution of the provincial council of Brabant fixing an annual tax, after January 1, 1900, on automobiles of whatever system. The rate is fixed at fifty francs ($9.65) for an automobile weighing 400 kilograms (800 pounds) or more, and twenty francs ($3.86) for one weighing less.

NOTES OF INTEREST

English automobile manufacturers have formed an organization in which there are thirty members. The object of the organization is to regulate the action of the members in exhibiting at the various exhibitions which they are solicited to patronize and to formulate a set of rules governing the selling of their goods to avoid a demoralization of trade by the practice of loose methods. No attempt will be made to regulate prices.

The editor of the Automobile Magazine is making systematic inquiries of the mayors of cities throughout the country in regard to ordinances governing the use of horseless carriages. While the results of the inquiries will, doubtless,

furnish interesting reading, it is questionable whether one who is as much interested in its progress as the editor in question will further the interests of the auto by calling the attention of city officials to the possible need for legislation adverse to it.

The New York Electric Vehicle Transportation Company announce the inauguration of Auto-Bus service in Buffalo beginning Dec. 19. One bus will be put on the route which covers some six miles through Buffalo's aristocratic thoroughfares. The vehicle will accommodate fourteen persons. If the venture proves successful several more vehicles will be added.

Herbert Githens, manager of the Gormully & Jeffery branch at Cleveland, is at work on a motor vehicle. He has made a tubular boiler and gasoline is used for fuel. Experiments in this direction seem to be quite the proper thing among G. & J. men at home and abroad.

The Elmore Mfg. Co., of Clyde, O., will probably cease manufacturing bicycles shortly. Mr. Becker thinks he has got beyond the experimental stage in the automobile line and expects to have vehicles ready for delivery in the spring of 1900. He uses a gasoline motor.

Report has it that Fanchon Thompson, a Chicago singer of decided ability, who has been studying and singing publicly in Paris for the past three or four years, is engaged to marry the Comte de Dion, of automobile fame.

The taking out of a permit to erect a $5,000 automobile stable in Pittsburg shows that the horseless vehicle is to be in pronounced evidence in that city.

The autocarriage that has been used by Fire Chief Edward Croker of New York has been shipped to Havana for use by Fire Commissioner Scannell.

An exchange says that the automobile has one advantage over the horse—it can't be expected to have more sense than its driver.

The coming of automobiles will unquestionably accelerate the impulse given by the bicycle to the making of good roads, says the Indianapolis News. When automobiles are made so cheaply that people must have them just as they must have improved farm machinery, then it may be expected that good roads will come with a rush. They cannot come too soon. It has been demonstrated by statistics that it costs American farmers three times as much to haul a ton as it does the farmers of Europe. But when automobiles on good roads so far reduce the cost of a carriage that their use must be general, then the conditions of their use, namely, roads fit for them to run on, may be expected.

Despite the efforts of Mr. Busby, the auto has not yet been given free access to Central Park, New York. The park commissioners have decided, however, to issue a limited number of permits for the use of horseless vehicles in the park, promising unlimited liberty in their use as soon as it has been thoroughly demonstrated that horses will not be unduly disturbed.

The New York Commercial Advertiser gravely asserts that the many automobile companies that are being organized are formed for the purpose of being bought up by the mythical auto-trust. The paper has evidently overlooked the fact that the motor of the auto-trust, like the motors of several auto-vehicles, refuses to work.

The Buffalo Gasoline Motor Co., of Buffalo, N. Y., has been incorporated with a capital of $25,000.

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L. C. CHASE & CO.
WESTERN WHEEL WORKS

All licenses heretofore held by other manufacturers have been cancelled for non-payment of royalty. A claim by any manufacturer except the above to have a valid license is false.

No licenses covering tires for use on vehicles have as yet been issued. Manufacturers, dealers and all other persons are warned not to make, sell or use any unlicensed tires. The undersigned believes it wiser to rely on the opinion and decree of a Judge of the United States Court, after nearly a year's mature consideration of evidence briefs and arguments, than on the opinion of any firm of lawyers whatsoever, and notifies the trade that he shall claim full damages for future infringements.

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